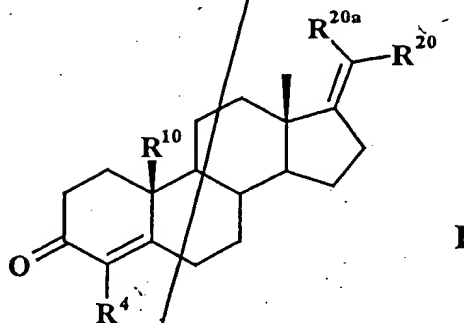


Claims

1. 17-Methylene steroids of general formula I



in which

R^4 stands for a halogen atom or a pseudohalogen,

R^{10} stands for a hydrogen atom or a straight-chain or branched C_1 - C_4 alkyl group,

R^{20} and R^{20a} , independently of one another, represent a hydrogen atom, a straight-chain or branched C_{1-4} alkyl or hydroxy- C_{1-4} alkyl group, or

one of radicals R^{20} and R^{20a} means a hydrogen atom, a straight-chain or branched C_{1-4} alkyl or hydroxy- C_{1-4} alkyl group, and the other radical means a halogen atom or a pseudohalogen.

2. 17-Methylene steroids according to claim 1, characterized in that R^4 stands for a chlorine or bromine atom or a cyano group.

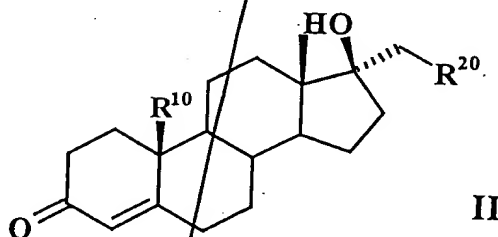
0963680 092701
T02260 08959660

100-443886-100

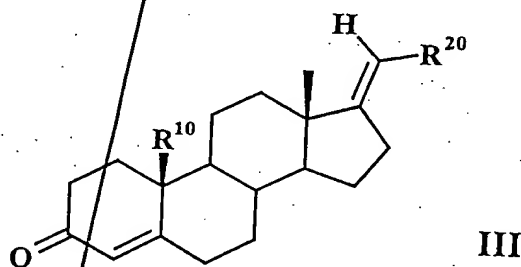
[illegible]

one.

6. Process for the production of 17-methylene steroids according to claim 1, in which R^{20a} means a hydrogen atom, wherein a compound of general formula II,



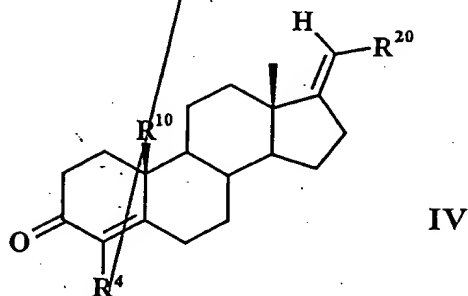
is reacted in an aprotic solvent with an acid chloride to a 17-methylene steroid of general formula III,



the 4,5-epoxide is generated with $H_2O_2/NaOH$, the 4,5-epoxide is then opened with a nucleophilic reagent, which is derived from a halogen atom or pseudohalogen, in a dipolar aprotic solvent to a halogen- or pseudohalogen hydrin, and optionally reacted with mineral acid, carboxylic acid or

T02260 08959660

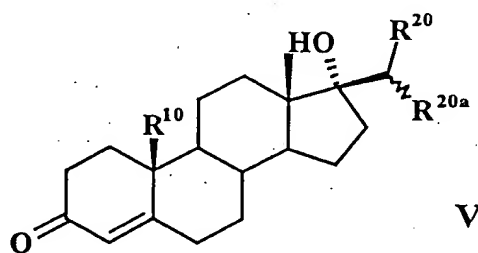
sulfonic acid in a protic or aprotic solvent with dehydration to a compound of general formula IV, in which



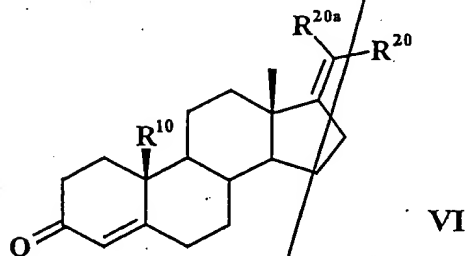
Sub B1

R⁴ stands for a halogen atom or pseudohalogen, whereby R¹⁰ has the meaning indicated in claim 1, and R²⁰ means a C₁₋₄ alkyl or hydroxy-C₁₋₄ alkyl group, a halogen atom or a pseudohalogen.

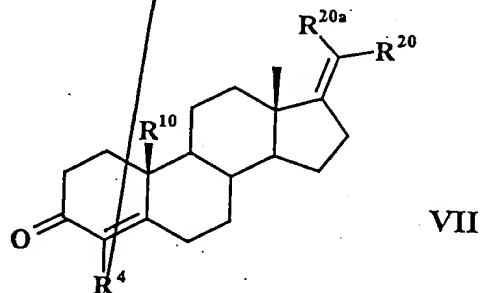
7. Process for the production of 17-methylene steroids according to claim 1, wherein a compound of general formula V,



is reacted with an acid chloride in an aprotic solvent to a methylene steroid of general formula VI,



the 4,5-epoxide is generated with $\text{H}_2\text{O}_2/\text{NaOH}$, the 4,5-epoxide is then opened with a nucleophilic reagent, which is derived from a halogen atom or pseudohalogen, in a dipolar aprotic solvent to a halogen- or pseudohalogen hydrin, and optionally reacted with mineral acid, carboxylic acid or sulfonic acid in a protic or aprotic solvent with dehydration to a compound of general formula VII,



in which R^4 stands for a halogen atom or pseudohalogen, whereby R^{10} has the meaning indicated in claim 1, and R^{20}

Sub B
means a C₁₋₄ alkyl or hydroxy-C₁₋₄ alkyl group, and R^{20a} means a hydrogen atom, a halogen atom or a pseudohalogen.

Sub A
8. Pharmaceutical compositions that contain at least one 17-methylene steroid according to claim 1, 2, 3, 4 or 5, optionally together with pharmaceutically compatible adjuvants and vehicles.

9. 17-Methylene steroids according to one of claims 1 to 5 for use as therapeutic active ingredients.

10. Use of the compounds according to one of claims 1 to 5 for treatment of prostate diseases, alopecia of the male type, acne and hirsutism, for contraception in men and women and/or for inhibition of 5 α -reductase.

0953580-092701